

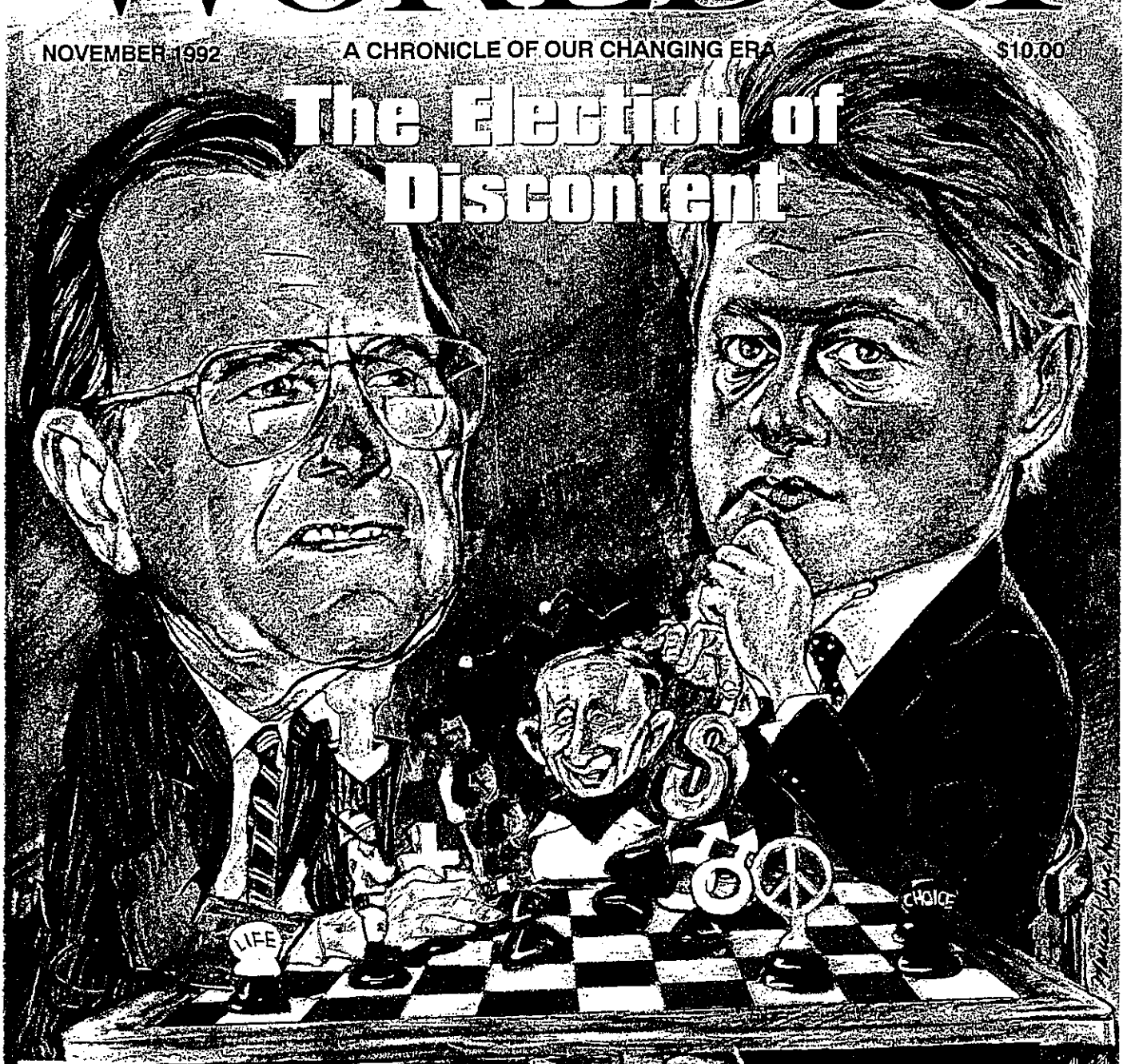
# THE WORLD & I

NOVEMBER 1992

A CHRONICLE OF OUR CHANGING ERA

\$10.00

## The Election of Discontent

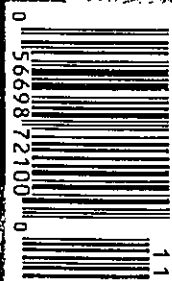


Richard Price's 'Clockers'

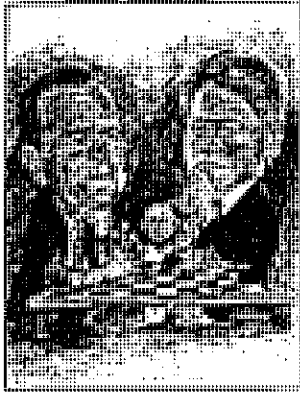
A MITI for America?

Photos from the Four Chinas

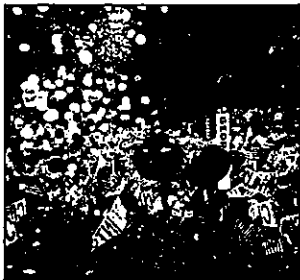
Xenophon on Political Leadership



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The '92 election is covered extensively in this month's Current Issues Special Report. Read on to discover: "Who Will Win?" beginning on page 20. Cover illustration by Marcia Klioze / THE WORLD & I.



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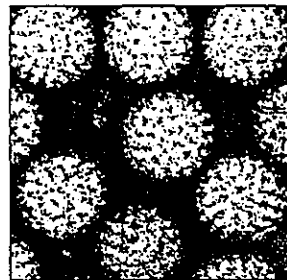
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# Deforestation and Public Policy

Patricia Parisi and Michael H. Glantz

*The rates of environmental changes are as important as the processes behind those changes.*

Global environmental change has become one of the most salient scientific and political issues of the 1990s. People and their governments have begun to realize that their societies have been fouling their environments at least since the onset of the Industrial Revolution in the mid-1700s.

Global warming, stratospheric ozone depletion, deforestation, human-induced sea level rise, and desertification are some of the major environmental changes that are or could be already under way today. Making a bad situation worse are the continually expanding population numbers that are sure to burden dwindling resources. Degradation of the natural environment is increasingly being seen as an impediment to achieving sustainable economic development. Thus, interest in as well as concern about the causes and consequences of environmental change have increased sharply in the past few years.

What makes an environmental issue a global problem?

Whether environmental degradation is considered a local problem or a global problem will most likely determine how it is addressed. Some environmental changes are considered global in origin: a natural warming or cooling of the global atmosphere or a period of change in solar activity that might affect global atmospheric processes. Others are considered global in effect although they might be local in origin: volcanic eruptions that alter the chemistry of the atmosphere on a global scale for lengthy periods of time or the local emissions of heat-trapping (greenhouse) gases.

Deforestation and desertification are two environmental changes that are local in origin and impact but have been labeled as global problems because they are occurring in many countries and have attracted worldwide interest.

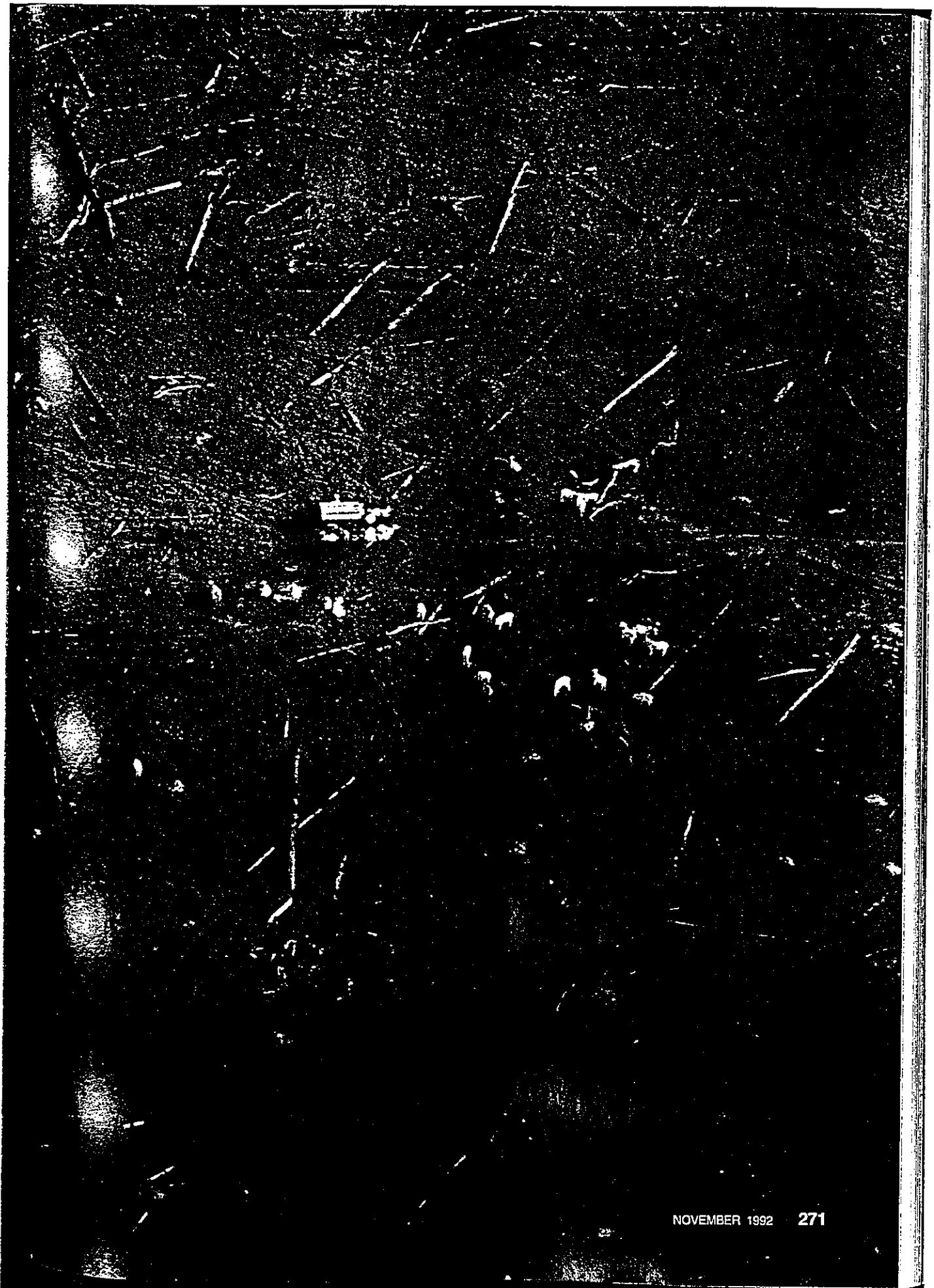
In the 1970s a series of UN conferences was convened to address these and other issues pertinent to the environment. The Earth Summit in Rio de

Janeiro in June can be viewed as the capstone to these many conferences, as it brought together political leaders from around the world for the purpose of addressing the global environment. From the Earth Summit came the Framework Convention on Climate Change, a biodiversity treaty, and Agenda 21, an environment and development agenda for the twenty-first century.

The catalyst for such a summit was the growing concern about a human-induced global warming of the lower atmosphere. Scenarios about the possible implications of a global warming have been generated by computer-based modeling, analyses of historical data with extrapolations to the future, and analogies of societal and environmental impacts of extreme meteorological events. The assumption is that a global warming some decades in the future would have serious implications for every

■ Cattle pasture on land that was once rain forest, state of Pará, Brazil.

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## DEFORESTATION AND PUBLIC POLICY

region of the planet from the equator to the poles. The climate convention was designed "to protect the climate system for present and future generations" or, more pointedly, to "freeze" the global climate regime as close as possible to its present state.

*Rates and processes*

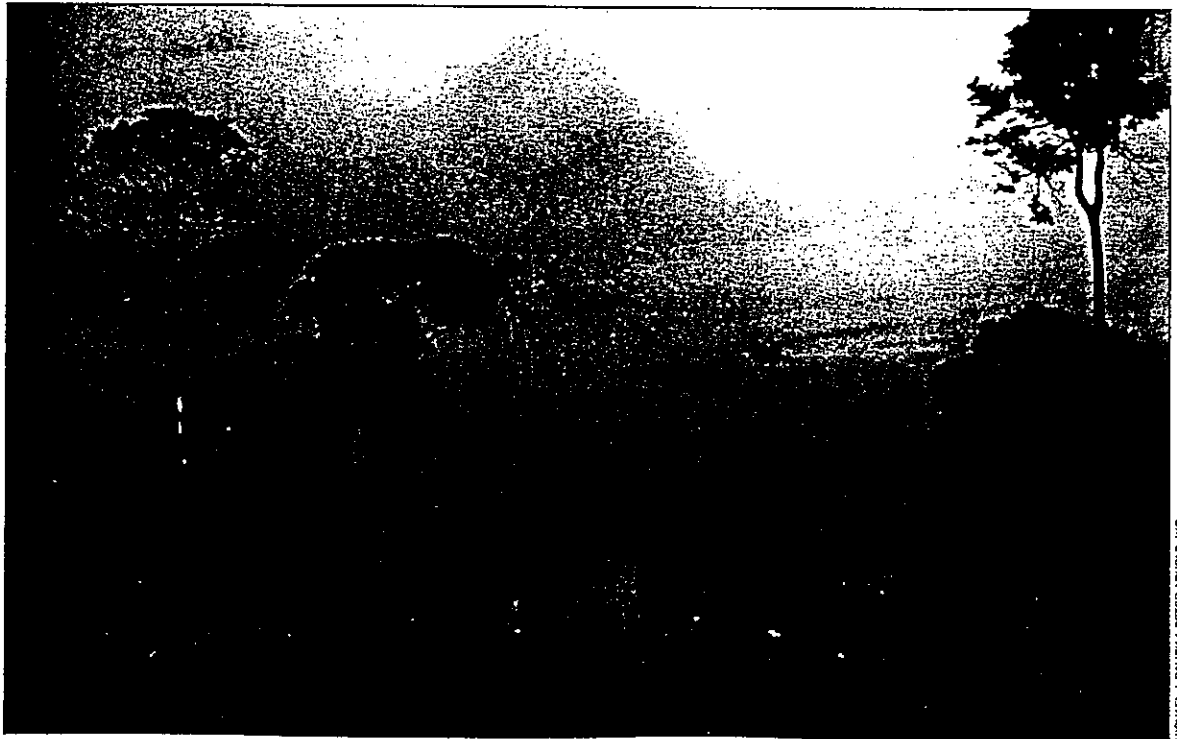
The processes of climate and other environmental changes are the subject of major national and global research efforts. Increased emissions of greenhouse gases, for example, are being studied in order to identify their cause-and-effect relationships to environmental changes. Chlorofluorocarbons contribute not only to ozone

depletion but to global warming as well. The use of fertilizers in agriculture not only adds to groundwater contamination but also to global warming. Deforestation adds carbon to the atmosphere, reduces local rainfall, and contributes to soil erosion, which causes silt buildup in rivers. Although research on these and other environmental changes continues, and much uncertainty remains about such changes, they have been the major focus of attention by researchers and policymakers.

As important as the processes of environmental change are the rates at which those changes occur. If scientists were to suggest that global warming would occur

in 1,000 years, policymakers would ask them to come back in 950 years with an update on its progress and possible impacts. If told it could be in 100 years, policymakers would consider the issue more closely. And if they were informed by a large fraction of the scientific community that such a change in global temperatures was likely in decades they would feel compelled to take action right away. High rates of change spark immediate policy responses, whereas slower rates are met with delayed political

■ Rain forest destruction, Transamazonia. Peer-reviewed estimates of tropical deforestation rates vary by a factor of six.



MICHAEL J. BALIUCK / PETER ARNOUD, INC.

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*Many people in the developing world, however, see nature preservation as an obstacle to improving their economies.*

responses and lengthy studies to resolve uncertainties. Thus, policymakers and scientists must be made to realize that the rates of environmental changes are as important as the processes behind those changes. Recall that inaction is a form of action in favor of the existing processes as well as rates of change.

In spite of their importance, rates of change are understood poorly and are more difficult to measure than the causes, as the rates vary from year to year and from region to region. Desertification (the creation of desertlike conditions where none existed) has been a major concern of governments around the world because of its devastating impact on food production potential, especially in sub-Saharan Africa. Scientific journals show wide-ranging differences (e.g., tenfold) in desertification rates. For tropical deforestation, those rates vary by a factor of six, and in the Amazon region by a factor of four. Which rates can policymakers rely on with some degree of confidence?

With respect to the tropical rain forests, if a politician favors exploitation, he or she can find the data to support their position.

Similarly, policymakers wanting to preserve tropical rain forests can just as easily find data to support their alarmist position. The problem is that one can find support in the literature to justify almost any desired policy action. The wide range of estimates also confuses the media, the purveyors (as well as translators) of scientific information for the public.

*The rain forest dilemma*

Tropical rain forests are of special concern to those worried about a variety of issues: loss of biodiversity, extermination of indigenous populations, and change of global climate. Latin America contains 57 percent of the world's tropical rain forests, Asia claims 25 percent, and Africa, 18 percent.

No one doubts the view that the spatial extent of the tropical rain forests, currently estimated to occupy about 13 percent of the land surface of the planet, is on the decline. The reasons for the decline, however, vary from region to region: In Latin America rain forests are being converted to pastureland; in sub-Saharan Africa they are being cleared to meet increasing demand for farmland and firewood; in South-

east Asia rain forests provide the hardwood products exported to industrialized countries. Other social factors prompting deforestation include but are not limited to: lack of equitable land reform programs, chronic poverty, large government development projects such as dam construction, poor forest management practices, demand for agricultural land, and government corruption.

The South American rain forests provide a good example of the problems that surround the rates aspect of environmental change. In fact, scientific journals and the media have focused their attention on the situation in the Amazon.

The Amazon forests are considered an integral part of the global climate system. They act as a major carbon sink, pulling carbon out of the atmosphere during photosynthesis and storing it. When bulldozers, chainsaws, and fires destroy the rain forest, fewer trees remain to engage in this natural process. In addition, when cut trees are burned or left in the field to decay, previously stored carbon is released back into the atmosphere as carbon dioxide, a major greenhouse gas.

## DEFORESTATION AND PUBLIC POLICY

Scientists estimate that about 25 percent of the human contribution to atmospheric carbon dioxide comes from the effects of worldwide deforestation.

As important as rates of change are to scientists and policymakers, it is still extremely difficult to identify them. Some of the problems include the varying definitions of forests, the techniques used to interpret rates, analogies used to convey such rates to the public, and attempts to determine the original extent of forest cover.

One might be easily lulled into thinking that definitions are just words and in the world of science they might not be so important. As we have recently seen, that was not the case with respect to wetlands in the United States. With the swipe of a pen the definition of wetlands was altered by the White House Council on Economic Competitiveness. As a result, about half of the currently defined wetlands could be removed from a federally protected status in favor of land developers who lobbied for such a change. This attempt at redefining wetlands has been contested by environmental groups and the U.S. Congress.

Tropical forests encompass different kinds of forests: closed and open, wet and dry, primary and secondary. Closed forests were recently characterized by the German Parliament's Enquete Commission on Protecting the Earth as having at least 50 percent tree canopy cover, high

amounts of precipitation, and minimal grass cover.

Open forests are those in which the canopy (the upper parts of a tree) covers at least 10 percent of the ground areas. Grass typically covers the land surface. Open tropical forests are also referred to as dry deciduous forests. Moist evergreen tropical forests are located close to the equator and include the Amazon and Congo basins, the land bordering Africa's Gulf of Guinea, the Indo-Malaysian Archipelago, and the eastern coast of Australia. They have also been referred to as closed dry forests, monsoon forests, seasonal forests, and semideciduous forests.

Primary forests are those that have been disturbed slightly or not at all by humans and that contain great biological diversity. They are also called climax forests, meaning that they are in a final stage of succession, which is the transformation of one ecosystem to another over long periods of time. Secondary forests are those that reestablish on sites previously cleared by logging or for shifting cultivation, cattle ranching, or infrastructure development. They reflect all stages of succession that take place on naturally bare land or on land cleared by humans. Since the composition and structure of secondary forests change over time, scientists often have difficulty distinguishing them from primary forests when using remote sensing.

Scientists as well as science

writers frequently interchange such terms as deforested, degraded, and destroyed in their description of environmental changes in the rain forests. These words, however, are not synonyms. Deforested refers to the removal of trees; degraded refers to ecosystem changes that often accompany tree-cutting; destroyed generally connotes the clear cutting of trees and other vegetation in a given location.

#### *Varying estimates*

In their attempts to express the large spatial extent as well as the rapidity with which rain forests are disappearing, writers have resorted to the use of popular analogies. The following portrayals are common in the literature: an area the size of a football field is being destroyed each minute in the Amazon; an area the size of Belgium, the Netherlands, and Luxembourg is deforested globally each year; every week 113,000 soccer fields are being cleared; an area the size of Great Britain went up in smoke; and so forth. While such statements do convey a sense of urgency, they do not provide a sense of accuracy. They tend to underscore the emotional aspects of deforestation in the tropics as opposed to its scientific and objective aspects. Furthermore, they tend to confuse readers by making it difficult to compare objectively the rates and extent of deforestation provided by different writers.

Another problem related to



*High rates of change spark immediate policy responses, whereas slower rates are met with delayed political responses.*

rates is the difficulty encountered in trying to determine the original extent of forest cover in the earlier decades of this century. Different researchers have based their rate estimates on "guesstimates" about the original extent of virgin forests. This is troublesome because scientists must often rely on uncalibrated records or proxy information to calculate rates of forest loss through destruction or conversion. Some researchers have tried to reconstruct the original extent of forest cover that could be supported in theory by the existing climate of the region. In either case,

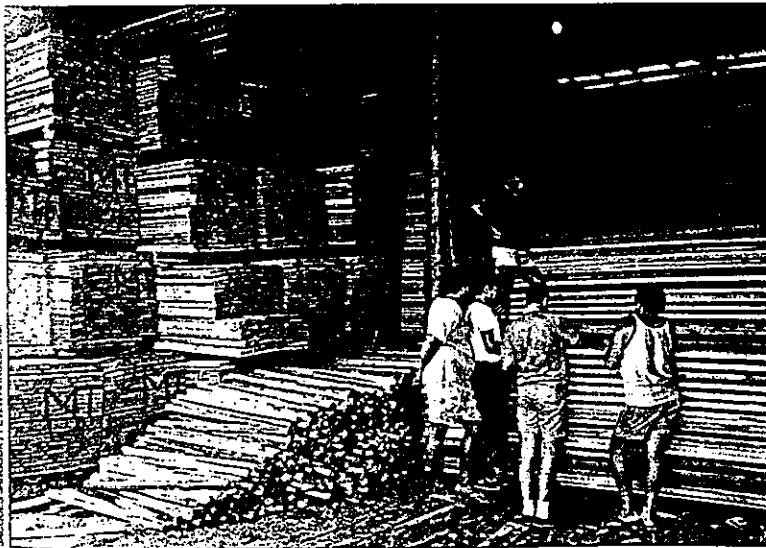
determining the extent of forest cover at the beginning of the twentieth century is fraught with uncertainties.

A review of articles on tropical deforestation in what we commonly refer to as the Amazon shows that researchers have used different geographic scales on which to base their rates of change estimates. Most readers do not readily draw the necessary distinctions between the Amazon, Amazonas, Amazonia, the Brazilian Amazon, the Amazon Basin, or the Legal Amazon. Sometimes these different spatial scales are used in the same article by the

same author.

The Amazon Basin encompasses parts of seven South American countries: Brazil, Ecuador, Venezuela, Peru, Colombia, Guyana, Suriname, and French Guiana; the basin covers about seven million square kilometers. It has also been referred to as Amazonia. The Brazilian Amazon, which covers about five million square kilometers, refers to the part of the basin that falls within Brazil's borders. Brazil's Legal Amazon is an administrative jurisdiction, consisting of the whole of six Brazilian states (Acre, Amapa, Amazonas, Para, Rondonia, Roraima) and parts of three others (Maranhao, Mato Grosso, and Tocantus). Comparing rates between these differently defined geographical units requires considerable expertise and care.

It is also noteworthy to point out that the high rates of deforestation in the Brazilian rain forest highlighted in the 1980s were based for the most part on spec-



■ Sawmill and lumber packed for export at the Amazon-Tocantins estuary complex on Marajó Island, Pará, Brazil.

## DEFORESTATION AND PUBLIC POLICY

tacular changes in the Brazilian state of Rondônia. It was there that the controversial World Bank-financed highway BR 364 was constructed in the absence of environmental impact assessments. As a result, the highway served as a conduit for urban migrants seeking to improve their quality of life in the rain forest.

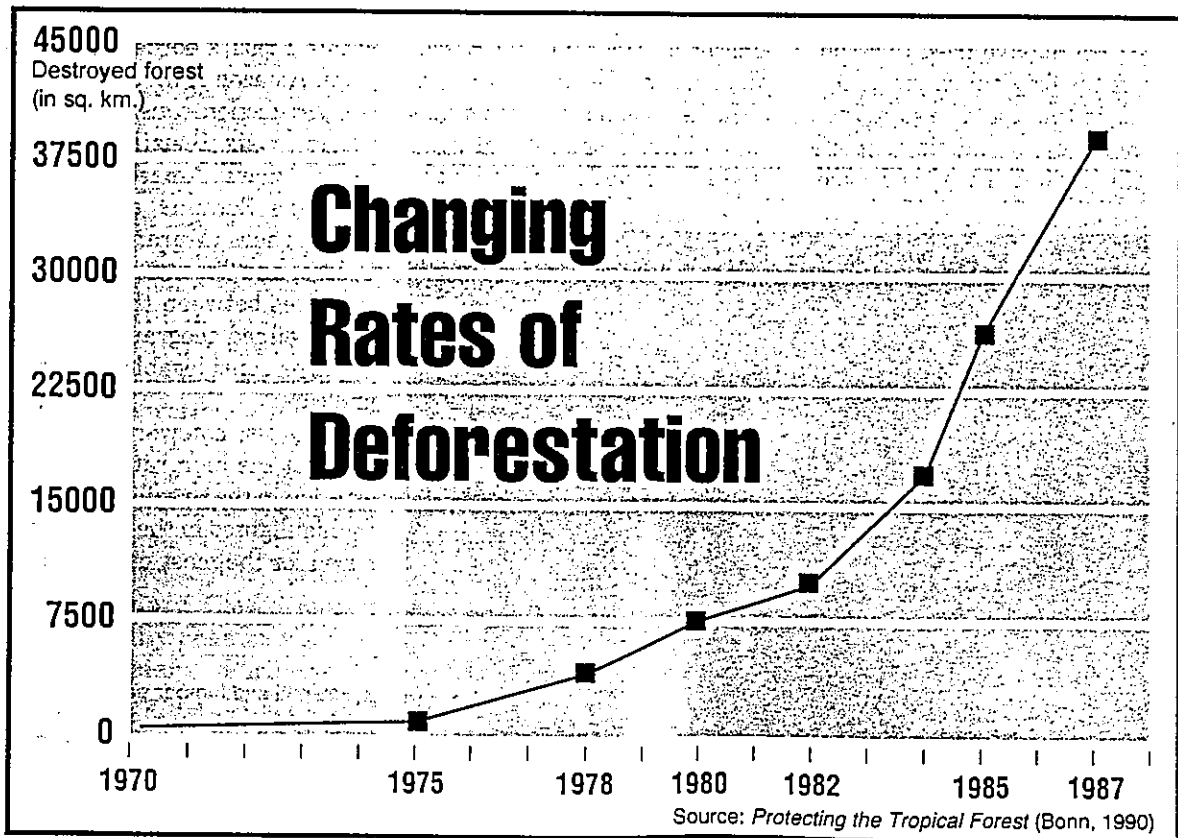
The accompanying chart depicts yearly changes in defor-

■ The rate of deforestation is not easy to calculate, as the rate often changes from year to year. This chart shows how the deforestation rate has changed from year to year for the Brazilian state of Rondônia.

estation in the Brazilian state of Rondônia during the 1980s and clearly shows how rates of change are not constant but can vary over time. Charts like these can be very instructive and can be used to encourage scientists to seek to identify and understand the natural and human processes behind those annual changes in rates.

Finally, any specific deforestation figure is questionable because of the inadequacies of current technology to monitor environmental changes in forested regions; such technology is either too costly or cannot provide the details required by local, regional, and national policymak-

ers. NOAA's weather satellites, for example, pass over the earth every day and are able to distinguish forested from nonforested areas, as well as detecting fires and plumes. However, with a resolution of one kilometer, the satellites gather relatively crude data over large areas, without the ability to differentiate gradual changes in forest types. Even with the more expensive, higher resolution (30-meter) LANDSAT satellites, scientists often have trouble distinguishing between primary forest areas and those areas that are in a state of regeneration. Fires further complicate evaluations by distorting satellite images, as the smoke appears on





Rain forest being cleared for manganese mining activities at Serra dos Carajás, Pará, Brazil. Changing land use can bring increasing environmental stress.

the images beyond where the fires are actually occurring.

### Conclusions

Decisionmakers have difficulty gaining an accurate picture of where and to what extent tropical deforestation is occurring given this state of confusion. Such discrepancies within the scientific literature enable policymakers to pursue their hidden agendas, be they conservation or all-out exploitation. The rates of environmental changes in general, and of deforestation in particular, are often as important to decisionmakers as are the processes of changes themselves.

Governments in the tropics, like others around the globe, are

pursuing development strategies designed to improve the quality of life of their citizens. Often, these strategies come into conflict with the desires by some members of the international community eager to preserve the global environment. A major reason for this conflict is the fact that many in the industrialized world are beginning to realize that they can no longer enjoy long-term sustained economic growth unless they maintain the health of their local, regional, and global environments.

Many people in the developing world, however, see nature preservation as an obstacle to improving their economies. In addition, policymakers in the Third World view the high level of industrial development within rich countries as having been achieved at the expense of the environment. Now that the developed countries have achieved their high standards of living,

they can turn their attention and resources to the restoration of their trashed environments.

The ongoing disappearance of tropical forests provides an example of how urgent and necessary it is to reduce the confusion surrounding the rates of deforestation so that rational policy decisions can be made before any ecosystem is completely sacrificed. The importance of sustaining the earth's tropical forests—their biodiversity, their indigenous inhabitants, their renewable products—cannot be overstated. This same urgency applies to the need to reassess the rates of wetland loss, desertification, ozone depletion, mangrove and coral reef destruction, and sea level rise.

The effects of misguided policies toward the environment based on insufficient, if not incorrect, scientific information will be felt immediately at the local, regional, and national levels, while the effects of climate change resulting from people degrading the earth's atmosphere and ecosystems will most likely be felt after many decades. The consequences of today's environmental policies must be acknowledged and dealt with now for the benefit of present and future generations. ■

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